Cambridge OCR-set Assignment

Sample Assessment Material

Cambridge OCR Level 3 Alternative Academic Qualification
Cambridge Advanced National in Applied Science

Unit F186: Medical physics

Scenario Title: Medical physics in diagnosis and therapy – Patients A and B

Valid for assessment from September 20XX to 20XX.
For use by students beginning the qualification in September 20XX.

This is a sample Cambridge OCR-set assignment which should only be used for practice**.**

This assignment **must not** be used for live assessment of students.

The live assignments will be available on our secure website, 'Teach Cambridge'.

The Cambridge OCR administrative codes linked to this unit are:

- unit entry code F186
- certification code H151

The regulated qualification number linked to this unit is:

610/3948/2

Duration

About:

- 15 hours of supervised time (GLH)
  (work that **must** be completed under teacher supervised conditions)
- 8 hours of unsupervised time
  (work that students can complete independently without teacher supervision)

SAMPLE

 © Cambridge OCR 2025

All this material **can** be photocopied. Any photocopying will be done under the terms of the Copyright Designs and Patents Act 1988 solely for the purposes of assessment.

SAMPLE

Contents

Information and instructions for Teachers....3
Using this assignment....3
Tasks for students and assessment criteria....5
Diagnosis Scenario....5
Therapy Scenario....5
Task 1....7
Task 2....9
Task 3....11
Task 4....13
Teacher Observation Record Form....14
Guidance notes....15
Risk Assessment Template....16
NEA Command Words....17

SAMPLE

Information and instructions for Teachers

Using this assignment

This assignment provides a scenario and set of related tasks that reflect how diagnosis and treatment techniques are selected and implemented, as well as how the data gathered is processed and understood.

You can give this to students on or after 1 June 202X to help them understand it before they start using it for assessment. The dates for which students can use it for assessment are shown on the front cover.

The assignment:
- Is written so that students have the opportunity to meet the requirements of all assessment criteria for the unit.
- Will tell students if their evidence must be in a specific format. If the task does not specify a format, students can choose the format to use.
- **Must** be completed under teacher supervision. Any unsupervised time allowed will be stated below and explained in the assessment guidance.

We have estimated that this assignment will take about 15 hours of supervised time and 8 hours of unsupervised time to complete. Students should need approximately:
- 7 hours to complete Task 1
- 7 hours to complete Task 2
- 5 hours to complete Task 3
- 4 hours to complete Task 4

You **must**:

- Use a Cambridge OCR-set assignment for summative assessment of students.
- Familiarise yourself with the assessment criteria and assessment guidance for the tasks. These are given at the end of each student task. They are also with the unit content in **Section 5** of the Specification.
  Assessment guidance is only given where additional information is needed. There might not be assessment guidance for each criterion.
- Make sure students understand that the assessment criteria and assessment guidance tell them in detail what they need to do in each task.
- Read and understand **all** the rules and guidance in **Section 7** of the Specification **before** your students start the set assignments.
- Make sure that your students complete the tasks and that you assess the tasks fully in line with the rules and guidance in **Section 7** of the

SAMPLE

Specification.

- Give your students the Applied Science **Student guide to NEA assignments before** they start the assignments.
- Complete the **Teacher Observation Record** for **Task 3**. You **must** follow the guidance given when completing it.

SAMPLE

You **must not**:

- Use live Cambridge OCR-set assignments for practice or formative assessment. This sample assessment material **can** be used for practice or formative assessment.
- Use this sample assessment material for live assessment of students.
- Allow group work for **any** task in this assignment.
- Change any part of the Cambridge OCR-set assignments or assessment criteria.

Pages 1-4 are for teachers only. Please do **not** give **Pages 1-4** to your students.

You can give **any** or **all** of the pages **that follow** to your students.

SAMPLE

Tasks for students and assessment criteria

Unit F186: Medical physics

Scenario Title: Medical physics in diagnosis and therapy – Patients A and B

Valid for assessment from September 20XX to 20XX.
For use by students beginning the qualification in September 20XX.

Diagnosis Scenario

Patient A is a 65-year-old woman who recently lost her husband, she has no children and lives alone. She has led a healthy lifestyle and other than an artificial hip replacement, has never had any serious medical issues in the past. Patient A has been experiencing persistent neck and chest pain for several weeks, which has been worsening over time. She has noticed that the pain is particularly severe at night and when lying down, making it difficult for her to sleep. The GP found that the patient has a family history of cancer and requested a preliminary examination, which revealed a mass in the patient's chest and some abnormalities in her thyroid gland. The GP has referred the patient to the hospital for an accurate diagnosis.

The large NHS hospital that the patient attends has a well-equipped radiology department, supported by an experienced team from the Nuclear Medicine Clinic and Radiopharmacy. However, rising costs at the NHS trust has meant that justification for costly procedures needs to be provided in writing and agreed upon by the team. Patient A is a little nervous about the tests that she has heard the hospital will need to run and is understandably worried about the outcomes of the scans.

The diagnosis technique(s) used will need to locate the presence of a tumour and determine whether or not that tumour is malignant. This may include the use of separate anatomical scans of the affected area of the body to accurately locate the tumour. You are the consulting physician and are required to create a diagnosis plan for patient A to present to your team of healthcare professionals.

Therapy Scenario

Patient B is a 19-year-old male and is a first-year university student who recently moved away from home to pursue his studies. He is generally healthy but admits to not getting much exercise due to a busy schedule. He does think that he maintains a balanced diet though.

The patient visited the GP after noticing a lump in his neck. He did not report any other symptoms such as fever or fatigue. The patient has a family history of cancer, which has made him somewhat anxious about his health, he has had

SAMPLE

regular check-ups in the past, but never experienced any major health issues before.

SAMPLE

The GP recommended that the patient initially has an ultrasound scan to determine the size and location of the lump.

The ultrasound revealed that the lump was a swollen lymph node. The short axis diameter of the lymph node was 1.4 mm.

A second scan using X-rays and an injected contrast medium revealed that the patient has lymphoma, but the cancer is currently localised to the lymph node within the patient's neck.

SAMPLE

Task 1

Medical physics in diagnosis

Topic Areas 1, 2 and 5 are assessed in this task.

The task is:

To create a diagnosis plan for the patient in the diagnosis scenario.

Your evidence **must** include:

- Written evidence
- A risk assessment using the template provided.

Use the assessment criteria below to tell you what you need to do in more detail.

Pass	Merit	Distinction
P1: Summarise the ionising diagnosis technique(s) that are suitable for the diagnosis scenario. (PO2)	**M1: Explain** why other diagnosis techniques are not suitable. (PO2)	**D1: Analyse** the advantages and disadvantages of your diagnosis plan. (PO3)
P2: Summarise the non-ionising diagnosis technique(s) that are suitable for the diagnosis scenario. (PO2)		
P3: Create a logical diagnosis plan for the patient in the diagnosis scenario, taking into account their needs. (PO4)	**M2:** Use research to **justify** the diagnosis plan for the patient in the diagnosis scenario. (PO4)	
P4: Create a risk assessment linked to the diagnosis plan. (PO4)		

SAMPLE

Assessment Guidance

This assessment guidance gives you information to meet the assessment criteria. There might not be additional assessment guidance for each criterion. It is only given where it is needed. You must read this guidance before you complete your evidence.

Assessment Criteria	Assessment guidance
P1	• Students only need to include the important and relevant facts about the suitability of each technique, limited to those explored in Unit F186.
P2	• Students only need to include the important and relevant facts about the suitability of each technique, limited to those explored in Unit F186.
P3	• The plan should be presented in an appropriate format.
P4	• The risk assessment should contain risks to the patient and other individuals. • The risk assessment only requires qualitative detail.
M1	• The explanations should include scientific reasoning.
M2	• This is an extension of the diagnosis plan created in **P3**. • Students should use research to give valid reasons for how the diagnostic techniques should be carried out. • The justification should include how the patient's needs were accounted for. • The research element of this criterion does not need to be completed under supervised conditions.
D1	• The focus of this analysis should be on the specific needs of the patient in the diagnosis scenario. • Reasoned comments on the viability of the diagnosis plan should be provided.

Advice:

- Remember to clearly reference any information used from books, websites or other sources to support your evidence.

SAMPLE

Task 2

Medical physics in therapy

Topic Areas 3, 4 and 5 are assessed in this task.

The task is:

To create a therapy plan for the patient in the therapy scenario.

Your evidence **must** include:

- Written evidence
- A risk assessment using the template provided.

Use the assessment criteria below to tell you what you need to do in more detail.

Pass	Merit	Distinction
P5: Summarise the ionising therapy technique(s) that are suitable for the therapy scenario. (PO2)	**M3: Explain** why other therapy techniques are not suitable. (PO2)	**D2: Analyse** the advantages and disadvantages of your therapy plan. (PO3)
P6: Summarise the non-ionising therapy technique(s) that are suitable for the therapy scenario. (PO2)		
P7: Create a logical therapy plan for the patient in the therapy scenario, taking into account their needs. (PO4)	**M4:** Use research to **justify** the therapy plan for the patient in the therapy scenario. (PO4)	
P8: Create a risk assessment linked to the therapy plan. (PO4)		

SAMPLE

Assessment Guidance

This assessment guidance gives you information to meet the assessment criteria. There might not be additional assessment guidance for each criterion. It is only given where it is needed. You must read this guidance before you complete your evidence.

Assessment Criteria	Assessment guidance
P5	• Students only need to include the important and relevant facts about the suitability of each technique, limited to those explored in Unit F186.
P6	• Students only need to include the important and relevant facts about the suitability of each technique, limited to those explored in Unit F186.
P7	• The plan should be presented in an appropriate format.
P8	• The risk assessment should contain risks to the patient and other individuals. • The risk assessment only requires qualitative detail.
M3	• The explanations should be brief and include scientific reasoning.
M4	• This is an extension of the therapy plan created in **P7**. • Students should use research to give valid reasons for how the therapy techniques should be carried out. • The justification should include how the patient's needs were accounted for. • The research element of this criterion does not need to be completed under supervised conditions.
D2	• The focus of this analysis should be on the specific needs of the patient in the therapy scenario. • Reasoned comments on the viability of the therapy plan should be provided.

Advice:

- Remember to clearly reference any information used from books, websites or other sources to support your evidence.

SAMPLE

Task 3

Present the plan

All topic areas are assessed in this task.

The task is:

To create and deliver a presentation for the healthcare professional(s) responsible for performing the technique(s) in the diagnosis scenario.

OR

To create and deliver a presentation for the patient receiving treatment in the therapy scenario.

Your evidence **must** include:

- A presentation of the diagnosis plan to healthcare professional(s) responsible for performing the technique(s) in the diagnosis scenario
- A Teacher Observation Record Form
- Written evidence

OR

- A presentation of the therapy plan to the patient receiving the technique(s) in the therapy scenario
- A Teacher Observation Record Form
- Written evidence.

Use the assessment criteria below to tell you what you need to do in more detail.

Pass	Merit	Distinction
P9: Create an appropriate presentation for the chosen scenario. (PO4)	**M5: Deliver** a presentation tailored to the intended audience, including information beyond what is included in the presentation document. (PO4)	**D3: Justify** the design and content of the presentation. (PO3)
P10: Suggest adaptations to the presentation for healthcare professionals or the patient. (PO2)		

SAMPLE

Assessment Guidance

This assessment guidance gives you information to meet the assessment criteria. There might not be additional assessment guidance for each criterion. It is only given where it is needed. You must read this guidance before you complete your evidence.

Assessment Criteria	Assessment guidance
P9	• The presentation should be in the format they feel is most appropriate, which could include a leaflet, a PowerPoint presentation, a flow diagram, etc. • There must be sufficient detail in the presentation to demonstrate the key components of their chosen plan.
P10	• If students have chosen to present the diagnosis plan, they should suggest adaptations to the presentation for the patient. • If students have chosen to present the therapy plan, they should suggest adaptations to the presentation for healthcare professionals.
M5	• Students must deliver their presentation to the class and/or teacher, but it must be delivered as though they were conveying the information to the audience selected. • The presentation delivered must go beyond what the students have prepared. • The teacher observation record form should comment on students' ability to deliver information that is beyond the presentation content, e.g. students could respond appropriately to questions from the audience.
D3	• Students should give valid reasons for the design and content of the presentation. • Students should also give valid reasons for information that is not explicitly provided in the presentation. • The scientific understanding of the techniques should inform the justification.

SAMPLE

Task 4

Review the plan

All topic areas are assessed in this task.

The task is:

- To obtain feedback on your chosen plan.
- To review the therapy plan or diagnosis plan that you created.
- To review the presentation that was delivered in Task 3.

Your evidence **must** include:

- Written evidence.

Use the assessment criteria below to tell you what you need to do in more detail.

Pass	Merit	Distinction
P11: Summarise the feedback received for your chosen plan. (PO2)	**M6: Assess** the strengths and weaknesses of your chosen plan. (PO3)	**D4: Justify** potential improvements to the plan. (PO3)
		D5: Evaluate the presentation to better meet the needs of the target audience. (PO3)

Assessment Guidance

This assessment guidance gives you information to meet the assessment criteria. There might not be additional assessment guidance for each criterion. It is only given where it is needed. You must read this guidance before you complete your evidence.

Assessment Criteria	Assessment guidance
P11	• Students should be selective when summarising the feedback received. • The feedback on the student's plan can be provided by the teacher and/or other students. Feedback on the student's plan can include feedback on the presentation itself.
M6	• This is an extension of **P11**.
D4	• Students should give valid reasons for their suggested improvements. • Students should consider any limitations of the information provided in the scenario. • The scientific understanding of the techniques should inform the justification.

SAMPLE

SAMPLE

Sample Cambridge OCR-set assignment Unit F186: Medical physics
Valid for assessment until 20XX.
Version 5: (September 2025)

Teacher Observation Record Form

Use this form to record what is observed.
Read the **guidance notes** below the form **before** you complete the form.

Cambridge OCR Level 3 Alternative Academic Qualification Cambridge Advanced National in Applied Science (Extended Certificate)

Unit number:	F186
Unit title:	Medical physics
Task number:	3
Task title:	Present the plan

Student's name:	
Date the activity was completed:	

What extra evidence is attached to the form?	

The **teacher** fills in this section:

What Assessment Criteria does this activity relate to? This activity relates to assessment criterion **M5**. For M5, you must comment on students' ability to deliver information that is beyond the presentation content e.g. students could respond appropriately to questions from the audience.	
How does the activity meet the requirements of the Assessment Criteria? You **must** describe: 1. what the student did 2. how it relates to the relevant Assessment Criteria.	
Teacher's name:	
Teacher's signature:	
Date:	

SAMPLE

SAMPLE

Sample Cambridge OCR-set assignment Unit F186: Medical physics
Valid for assessment until 20XX.
Version 5: (September 2025)

The **student** fills in this section:

I agree with my teacher's description of how I completed this activity Yes ☐	
Use this space to make any extra comments.	
Student's signature:	
Date:	

Guidance notes

Both the teacher **and** the student are responsible for completing this form.

The **teacher must**:
- use the form to describe in detail what they observed the student doing.
- give contextualised details of what the student did and how this relates to the Assessment Criteria.
- say how well the activity was completed in relation to the Assessment Criteria with reasons.
- share what they have written with the student and offer the opportunity to discuss if the student disagrees with what is written.
- reach agreement with the student before the work is submitted for moderation.
- sign and date the form as evidence of agreement.

The **student must**:
- reach agreement with the teacher before the work is submitted for moderation.
- use the form to show that they agree with the teacher's record of the activity observed.
- sign and date the form as evidence of agreement.

The form **must**:
- be accompanied by extra evidence, as required by the task.
- provide evidence that is individual to the student.

The form **must not**:
- contain a simple repeat of the Assessment Criteria.
- contain just a list of skills.
- be completed by anyone other than the teacher observing the activity and the student completing the activity.
- be written by the student for the teacher to sign.
- be used to evidence achievement of a whole unit or task in isolation.

SAMPLE

Risk Assessment Template

Title of investigation	
Candidate Name	
Date Completed	

Hazardous chemical, procedure or equipment	Hazard	Risk	Control measures	Emergency measures
Example, ethanol (pure)	*Highly flammable*	*Both liquid and vapour can catch fire if exposed to naked flame or sparks*	*Keep lid on bottle, keep away from naked flame*	*Do not attempt to put out an ethanol fire with water. A foam extinguisher should be used or place a fire blanket or heatproof mat onto the flame.*

Include references for the sources of information used.

SAMPLE

© Cambridge OCR 2025

NEA Command Words

The table below shows the command words that may be used in the NEA assignments and/or assessment criteria.

Command Word	Meaning
Adapt	• Change to make suitable for a new use or purpose
Analyse	• Separate or break down information into parts and identify their characteristics or elements • Explain the different elements of a topic or argument and make reasoned comments • Explain the impacts of actions using a logical chain of reasoning
Assess	• Offer a reasoned judgement of the standard or quality of situations or skills. The reasoned judgement is informed by relevant facts
Calculate	• Work out the numerical value. Show your working unless otherwise stated
Classify	• Arrange in categories according to shared qualities or characteristics
Compare	• Give an account of the similarities and differences between two or more items, situations or actions
Conclude	• Judge or decide something
Describe	• Give an account that includes the relevant characteristics, qualities or events
Discuss (how/whether/etc)	• Present, analyse and evaluate relevant points (for example, for/against an argument) to make a reasoned judgement
Evaluate	• Make a reasoned qualitative judgement considering different factors and using available knowledge/experience
Examine	• To look at, inspect, or scrutinise carefully, or in detail
Explain	• Give reasons for and/or causes of something • Make something clear by describing and/or giving information
Interpret	• Translate information into recognisable form • Convey one's understanding to others, e.g. in a performance
Investigate	• Inquire into (a situation or problem)
Justify	• Give valid reasons for offering an opinion or reaching a conclusion
Research	• Do detailed study in order to discover (new) information or reach a (new) understanding
Summarise	• Express the most important facts or ideas about something in a short and clear form

We might also use other command words but these will be:

SAMPLE

© Cambridge OCR 2025

- commonly used words whose meaning will be made clear from the context in which they are used
- subject specific words drawn from the unit content.

SAMPLE